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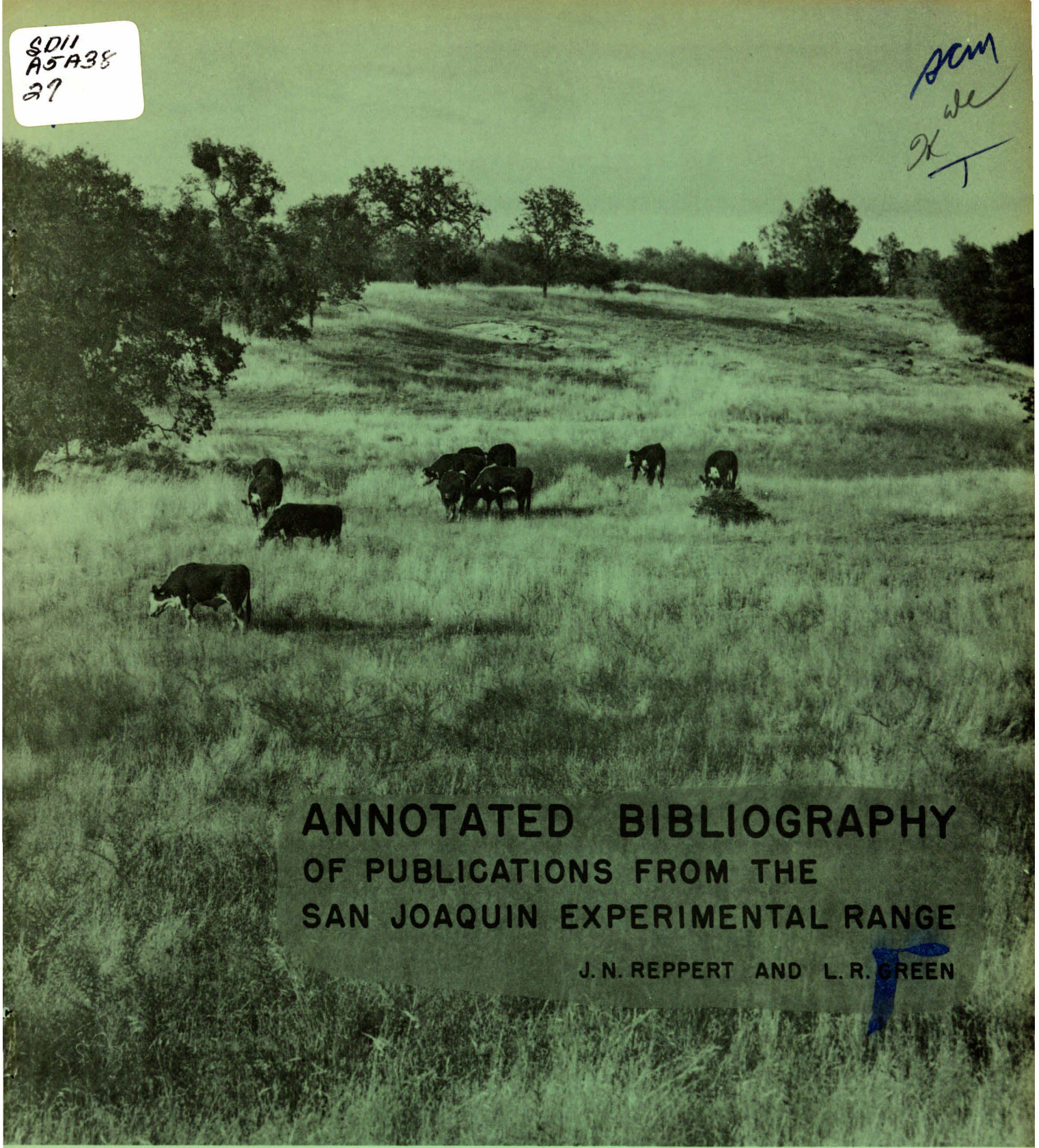

ANNOTATED BIBLIOGRAPHY OF PUBLICATIONS FROM THE SAN JOAQUIN EXPERIMENTAL RANGE

J. N. REPPERT AND L. R. GREEN

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CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
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ANNOTATED BIBLIOGRAPHY OF PUBLICATIONS FROM THE SAN JOAQUIN EXPERIMENTAL RANGE

By
Jack N. Reppert, Range Conservationist,
California Forest and Range Experiment Station

and

Lisle R. Green, Formerly Range Conservationist,
California Forest and Range Experiment Station
present address:
California State Polytechnic College,
San Luis Obispo, California

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The Experiment Station is maintained at Berkeley, California,
in cooperation with the University of California.

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ANNOTATED BIBLIOGRAPHY OF PUBLICATIONS FROM THE SAN JOAQUIN EXPERIMENTAL RANGE

Introduction

The San Joaquin Experimental Range was established by the Forest Service, U. S. Department of Agriculture in 1934. From the outset the Department of Animal Husbandry, University of California, Davis, provided cattle and cooperated with the Forest Service on many joint research projects. The California Agricultural Experiment Station has also been an active cooperator at the San Joaquin Experimental Range since the start. Other agencies have been represented from time to time. This paper lists the publications based upon research conducted at the San Joaquin Experimental Range and published since its establishment.

The Forest Service has been responsible for operating and maintaining the Experimental Range, as well as preparing many of the publications. The California Agricultural Experiment Station has made many contributions to the pool of knowledge concerning this foothill area. Other cooperators have been the United States Fish and Wildlife Service and the Agricultural Research Service. The facilities of the Experimental Range are available to scientists from universities and colleges for research. Many students from high schools and colleges, as well as foreign groups visit and study here each year.

The Experimental Range is located in the western foothills of the Sierra Nevada, near O'Neals, California. The elevation ranges from 700 feet to 1,700 feet. Soils are generally shallow sandy loams; most are residual with only 12 percent alluvial. This 4,600-acre experimental area is representative of the annual-type range found in the granite-soil area of the foothills. This area of granitic soils makes up nearly one million acres from Mariposa County to Kern County. To a lesser extent the Experimental Range is typical of the many million acres of California rangeland dominated by annual plants. The foothill annual-type range is of paramount importance to the beef cattle industry of California, and the annual range type at San Joaquin is representative of 18 percent of the livestock grazing provided by national forests in California.

The climate is characterized by mild, wet winters and hot, dry summers. The annual precipitation, almost entirely rain, averaged 19.9 inches for the 24-year period, 1934-35 to 1957-58. Fluctuation in precipitation from year to year and variable distribution within a growing season cause large fluctuations in the annual herbage crop.

A grazing year consists of three natural seasons: (1) "inadequate green season," the period following general germination in the fall but before new green herbage will adequately support livestock; (2) "adequate green season," the period during which the new green herbage is adequate to maintain and improve livestock weights; and (3) "dry season," the period characterized by dried range plants inadequate in protein for substantial livestock gains.

More than 60 percent by weight of the annual plant herbage produced is by introduced species. Broad-leaf filaree (Erodium botrys Bertol.), soft chess (Bromus mollis L.), and foxtail fescue (Festuca megalura Nutt.) are the three most abundant species.

Many problems of the annual-type ranges are related to wise and efficient use of the vegetation. Research projects conducted at the San Joaquin Experimental Range have been and are designed to furnish solutions to these problems.

Early range management research at the Experimental Range was directed toward determination of grazing capacity and effects of different intensities and seasons of grazing upon the condition of the range. Erosion and precipitation runoff studies were also conducted during the early years. Nursery and other seeding trials were made with annual and perennial range plants from all over the world. More recently range management research has centered on range improved by sulfur fertilization. Conversion of brush to grass has been studied. Recommendations have been developed for crushing, burning, and spraying brush to reduce or remove plant competition and allow an increase in desirable range herbage production.

Research involving livestock has been concerned with increasing beef production through larger calf crops, improved nutrition, and reduced losses from poisonous plants, animal diseases, and other factors. This has required many studies throughout the broad field of livestock production.

The abundance of wildlife in the area has prompted zoologists to conduct intensive studies at the Experimental Range. Competition for range forage between rodents and livestock has formed the basis of some work. Various ecological relationships between species of wildlife have formed the basis of other studies. Game species such as the valley quail have been the subject of research efforts.

The publications resulting from all this research are listed here in four subject classifications: General, range management, livestock, and zoological. To help show the history of publications at the Experimental Range, the arrangement of this bibliography is chronological by senior authors. Most of these publications are available in public and school libraries of California and other states.

General

(1) CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
1936. San Joaquin Experimental Range—a research area for investigation of problems of foothill range management in central California. 11 pp., illus. (Processed).

Tells of the need for intensive study of problems related to California foothill range management. Discusses the establishment of the San Joaquin Experimental Range and the first research projects.

(2) HUTCHISON, C. B., and KOTOK, E. I.
1942. The San Joaquin Experimental Range. Calif. Agr. Expt. Sta. Bul. 663. 145 pp., illus.

A detailed bulletin describing much of the background of the Range and the many studies conducted upon it. Separate contributions include:

The experimental area. Talbot, M. W., Nelson, J. W., and Storie, R. E. pp. 7-12. (Concise description of the climate, soils, and experimental facilities.)

The forage crop and its management. Talbot, M. W., and Biswell, H. H. pp. 13-49. (Detailed description of the various forage species and characteristics of this annual-type range.)

Experimental herd management. Wagnon, K. A., Guilbert, H. R., and Hart, G. H. pp. 50-82. (Describes studies involving range cattle, emphasizing seasonal deficiencies in the range forage.)

Ranch organization and management in the granite area. Voorhies, E. G., Crawford, L. A., Adams, R. L., and Carpenter, G. A. pp. 83-95. (Reports conditions found upon ranches in the area surrounding the Range.)

Interrelations of rodents and other wildlife of the Range. Horn, E. E., and Fitch, H. S. pp. 96-129. (Deals with several studies involving local fauna.)

Studies on valley quail. Storer, T. I., Cronemiller, F. P., Horn, E. E., and Glading, Ben. pp. 130-135. (Important contributions to the management of this valuable game species.)

Other studies and experiments in the program of the San Joaquin Experimental Range. Talbot, M. W., Biswell, H. H., Rowe, P. B., and Sampson, A. W. pp. 136-142. (Describes studies of reseeding, erosion, and chemical composition of range species.)

(3) METCALF, WOODBRIDGE
1954. Progress report on penta treated fence posts. Calif. Agr. Ext. Serv. Mar. 4 pp. (Processed).

Reports the results of treating 17 species used for fence posts after 7 1/2 years of service.

(4) WAGNON, K. A., HOWARD, W. E., and ALBAUGH, R.
1953. In memoriam: Harold Reed Guilbert. Jour. Range Mangt. 6 (3): 200.

A biographical sketch.

Range Management

(5) BENTLEY, J. R.
1941. Some characteristics of the annual type range of central California. Utah Juniper. 12: 12-14.

A general description of the annual-type with numerous comparisons made with perennial ranges.

(6) BENTLEY, J. R.
1943. Reseeding trials in Sierra Nevada foothills. West. Livestock Jour. 21 (49): 44, 46-48, 50-51, illus.

Reviews nursery trials, discussing several annual and perennial range forage species which showed promise out of 250 species tested.

(7) BENTLEY, J. R., and TALBOT, M. W.
1945. How many head? West. Livestock Jour. 23 (43): 21, 40, illus.

Study of the effects of intensity of grazing upon range plants shows a moderate degree of use to be most satisfactory in maintaining the forage resource.

(8) BENTLEY, J. R.
1946. Forage species tested for more extensive reseeding trials on central California rangelands. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Res. Note 48. 13 pp. (Processed).

Recommends further plantings of 75 species which looked promising in nursery and extensive field trials.

(9) BENTLEY, J. R.
1946. Range fertilization—one means of improving range forage. Calif. Cattleman. Sept. pp. 6, 24, illus.

Fertilization of annual-type ranges, particularly with gypsum, gives more promise of positive results than any other cultural practices studied.

(10) BENTLEY, J. R., and TALBOT, M. W.
1948. Annual plant vegetation of the California foothills as related to range management. Ecol. 29 (1): 72-79, illus.

Reviews the characteristics of the California annual-type range and emphasizes the importance of basing range management upon the annual vegetation.

(11) BENTLEY, J. R., and TALBOT, M. W.
1949. Why seed brush burns? In "What we know about brushland management in California". Agr. Ext. Serv. Univ. of Calif. Sept. pp. 20-23 (Also published in Calif. Cattleman. 1950, Aug. pp. 10-11 and in West. Livestock Jour. 1950. 28 (64): 60-61, under title, "Seeding burns—value of proper improved range management cited.")

Seeding of a burn is a tool in converting dense brushland to open grassland as well as a tool for improving the quality of growing herbage.

(12) BENTLEY, J. R., and TALBOT, M. W.
1951. Efficient use of annual plants on cattle ranges in the California foothills. U. S. Dept. Agr. Cir. 870. 52 pp., illus.

A detailed study furnished data from which recommendations were made concerning fitting ranch operations to forage growth, adjusting ranch stocking to herbage production, and selecting the most efficient degree of grazing.

(13) BENTLEY, J. R., and GREEN, L. R.
1954. Stimulation of native annual clovers through application of sulfur on California foothill range. Jour. Range Mangt. 7 (1): 25-30, illus.

Increased production of both clovers and grasses can be obtained at relatively small expense by fertilization of the range.

(14) BENTLEY, J. R., and BUTTERY, R. F.
1957. It takes more than just high rainfall. West. Livestock Jour. 35 (47): 152-154, illus.

Review of past precipitation records and herbage production data reveals the prime importance of timely rainfall distribution to insure abundant herbage production.

(15) BENTLEY, J. R., GREEN, L. R., and WAGNON, K. A.
1958. Herbage production and grazing capacity on annual-plant range pastures fertilized with sulfur. Jour. Range Mangt. 11 (3): 133-140, illus.

Sulfur fertilization of two pastures increased herbage production by 57 percent and 59 percent over two unfertilized pastures. Grazing capacity was increased approximately 50 percent by the fertilization.

(16) BISWELL, H. H.
1939. A change in our California forage plants. Calif. Cattleman. Sept. pp. 4-5.

It is difficult to state whether a change has taken place from a perennial-type to the present annual-type since the coming of white man; however, an influx of introduced annuals has occurred.

(17) BISWELL, H. H.
1940. Subterranean clover growing well at the San Joaquin Experimental Range. Calif. Wool Grower. 16 (39): 4-5.

Describes strains of a promising range plant introduced into Australia from Europe then to the United States. Reports findings from Australia and California and makes recommendations for further testing.

(18) BISWELL, H. H., and STREET, J. F.
1948. Range brush studies and control methods. Calif. Cattleman. Dec. pp. 23-24.

Burning or cutting is recommended to keep stands of wedgeleaf ceanothus from becoming dense.

(19) BISWELL, H. H., and GRAHAM, CHARLES A.
1956. Plant counts and seed production on California annual-type ranges. Jour. Range Mangt. 9 (3): 116-118, illus.

Counting seedlings and mature plants in this type was found to have limited inventory value because of the great numbers of plants and time required for counting. Production of seed was noted to be high under normal weather and grazing conditions.

(20) BUTTERY, ROBERT F., and GREEN, LISLE R.
1958. A checklist of plants of the San Joaquin Experimental Range. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Misc. Paper No. 23. 32 pp. (Processed).

A list of the local flora telling of the abundance and habitat for each species.

(21) GORDON, AARON, and SAMPSON, ARTHUR W.
1939. Composition of common California foothill plants as a factor in range management. Calif. Agr. Expt. Sta. Bul. 627. 95 pp., illus.

Detailed paper reporting the chemical composition of many plant species collected at various growth stages. Reports fluctuations in crude protein, silica-free ash, calcium, phosphorous, potassium, and crude fiber for species of grasses, grass-like plants, broad-leaved herbs, deciduous shrubs and trees, half-shrubs, and nondeciduous shrubs.

(22) GRAHAM, CHARLES ANSON
1956. Some reactions of annual vegetation to fire on Sierra Nevada foothill rangeland. Univ. of Calif. M. S. Thesis. June. 26 pp., illus.

Reports many findings including the fact that total forage yield was substantially reduced the first year following burning mainly because of the adverse effect upon grass plants. Recommends only spring grazing during this first year of low production.

(23) GRAHAM, CHARLES A.
1958. Killing brush sprouts on open woodland range in California. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Forest Res. Note 136. 5 pp., illus. (Processed).

Chemical control of brush sprouts following controlled burning was shown to be most effective and still economical if done for three years.

(24) GREEN, L. R., and WAGNON, K. A.
1954. Sulfur fertilization at the San Joaquin Experimental Range. Calif. Livestock News. 30 (3): 3-4. (Summary of talk given at Calif. Section, American Society of Range Management annual meeting).

Data presented show results of sulfur fertilization to be: (1) increased grass, legume, and forb production and a loss in filaree production, (2) a change in cattle diet favoring more clover and less grass, (3) increased grazing capacity, and (4) economic feasibility.

(25) GREEN, L. R., and BENTLEY, J. R.
1954. Some costs and returns from applying sulfur fertilizers on rangeland. Calif. Cattleman. May. pp. 8-9, illus. (Also in Westland Pasture Jour. 1954. 5 (2): 1, 3-4, illus.)

Reports economical results from fertilizing extensive acreages of rangeland.

(26) GREEN, LISLE R., and BENTLEY, JAY R.
1957. Seeding and grazing trials of stipa on foothill ranges. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Forest Res. Note 128. 9 pp., illus. (Processed).

Two seeded species of native stipa have competed well with the annuals for eleven years. Recommends fall and winter grazing of stipa.

(27) GREEN, LISLE R., and GRAHAM, CHARLES A.
1957. Observations on growth and control of tarweed. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Forest Res. Note 130. 8 pp., illus. (Processed).

Good results were obtained in tarweed control by both mowing in early full flowering stage and broadcast chemical spraying.

(28) GREEN, LISLE R., and CORNELIUS, DONALD R.
1957. Pampasgrass in the Sierra foothills. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Forest Res. Note 132. 7 pp., illus. (Processed).

This perennial plant shows promise of providing green forage in the summer and fall where summer moisture is available in deep, medium to fine-textured soils.

(29) GREEN, L. R., WAGNON, K. A., and BENTLEY, J. R.
1958. Diet and grazing habits of steers on foothill range fertilized with sulfur. Jour. Range Mangt. 11 (5): 221-227, illus.

Fertilization produced desirable changes in species production and chemical composition which in turn influenced the diet and grazing habits of steers.

(30) GREEN, LISLE R., and GRAHAM, CHARLES A.
1958. Annual legumes on granitic soil in the central Sierra foothills. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Tech. Paper No. 24. 11 pp., illus. (Processed).

Stands of introduced annual legumes have been successfully established only on bottomland soils. Fertilization of native clovers offers the best possibility of forming a legume range.

(31) HORMAY, A. L., and FAUSETT, A.
1942. Standards for judging the degree of forage utilization of California annual-type ranges. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Tech. Note 21. 13 pp., illus. (Processed).

A pictorial and word description of degree of forage utilization and range condition.

(32) HORMAY, AUGUST L.
1944. Moderate grazing pays on California annual-type ranges. U. S. Dept. Agr. Forest Serv. Leaflet No. 239. 8 pp., illus.

Relates advantages of moderate grazing and gives standards for judging different degrees of utilization.

(33) HORMAY, AUGUST L., and BENTLEY, J. R.
1949. The land variability factor in cattle-grazing experiments. Proc. Berkeley Symposium on Math. Statis. and Prob. Univ. of Calif. Press. pp. 465-467.

Discusses the many variables encountered in a range research study and suggests a new statistical approach to future experiments.

(34) TALBOT, M. W., BISWELL, H. H., and HORMAY, A. L.
1939. Fluctuations in the annual vegetation of California. Ecol. 20 (3): 394-402, illus.

Describes characteristics of the California annual-type including the importance of Old World annuals, the variability in the vegetation from season to season and within seasons, and the quick response of the vegetation to various treatments.

(35) WAGNON, KENNETH A., and BISWELL, HAROLD H.
1943. Two types of broad-leaf erodium in California. Madrono. 7 (4): 118-125, illus.

A detailed taxonomic description of two forms of Erodium botrys; key included.

(36) WAGNON, K. A.
1947. Alfilaria. Pacific Stockman. 13 (4): 6, 20, 21, 27, illus. (Also in Calif. Wool Grower. 1951. 27 (36): 6-7 illus. Under title, "Range specialist explains differentation among common alfilaria.")

A chemical and taxonomic description of several species of the important range forage genus of Erodium.

(37) WAGNON, KENNETH A.
1953. Another slant on range management. Calif. Farmer. 199 (3): 136.

A review of work done at the San Joaquin Experimental Range and other areas expressing the importance of basing foothill range management upon the annual vegetation.

(38) WYCKOFF, STEPHEN N.
1952. Growing and using the forage crop on California national forest lands. Calif. Cattleman. Oct. pp. 12-16.

Reviews many of the principles evolved for efficient use of California foothill ranges emphasizing stocking rates, fertilization, and brush conversion.

Livestock

(39) GUILBERT, H. R., and WAGNON, K. A.
1938. Supplemental feeding of steers on range profitable in California experiment. West. Livestock Jour. 17 (4): 14.

Three years of data are presented showing how range supplementing is economical.

(40) GUILBERT, H. R.
1941. Grass brings best returns when supplemented. West. Livestock Jour. 20 (1): 18-20, illus.

The advantages of supplementing on the range are related.

(41) GUILBERT, H. R.
1942. Supplemental feeding of range cattle. Pacific Stockman. 8 (6): 5, 11, illus.

An economical method is presented for obtaining good calf crops, animal gains, and quality of product on nutritively inadequate dry range forage.

(42) GUILBERT, H. R.
1943. Producing beef for war needs. West. Livestock Jour. 21 (17): 24, 26.

Advises a high plane of nutrition for cattle on the range in order to obtain continuous growth and more efficient use of the range, time, and manpower.

(43) GUILBERT, H. R., WAGNON, K. A., and HART, G. H.
1943. Continuous growth important in beef production. West. Livestock Jour. 22 (7): 13, 30-31.

Stresses the importance and method of obtaining a continuous gain of 1 to 1.25 pounds per head per day when wintering young cattle.

(44) GUILBERT, H. R., WAGNON, K. A., and HART, G. H.
1944. Finishing steers and heifers on the range. West. Livestock Jour. 22 (43): 15, 66-67, illus. Also - Pacific Stockman. 1944. 10 (10): 17-18, illus.

Feeding supplements to cattle upon the range to promote continuous growth after weaning is shown to be a method of marketing finished animals from the range.

(45) GUILBERT, H. R., HART, G. H., WAGNON, K. A., and GROSS, H.
1944. The importance of continuous growth in beef cattle. Calif. Agr. Expt. Sta. Bul. 688. 35 pp., illus.

Data and photographs stress the desirability of supplementing steers during the dry season from July to January to obtain continuous growth.

(46) GUILBERT, H. R., HART, G. H., and WAGNON, K. A.
1948. Value of urea tested as a partial substitute for protein in range supplemental feeding. Calif. Agr. 2 (2): 10, 13. Also in West. Livestock Jour. 1948. 26 (22): 82-83. under title "Urea tests show use as supplement," and in Fresno Bee, County Life Sec., 1948, March 21. p. 10.

Experimental data are discussed concerning the partial substitution of urea (nonprotein nitrogen) for protein in the diet of range cattle.

(47) GUILBERT, H. R., WAHID, A., WAGNON, K. A., and GREGORY, P. W.
1948. Observations of pigmentation of eyelids of Hereford cattle in relation to occurrence of ocular epitheliomas. Jour. Anim. Sci. 7 (4): 426-429.

This economically important malady was studied. Breeding for red around the eyes was suggested to lessen susceptibility.

(48) HART, GEORGE H., and WAGNON, KENNETH A.
1943. Does slaughter of pregnant cows reduce poundage of beef and financial returns? West. Livestock Jour. 22 (1): 86, 88.

Study of six animals revealed the economic advantages for holding pregnant cows for sale after calves are produced.

(49) HART, G. H., WAGNON, K. A., and GUILBERT, H. R.
1945. How many head? Overstocking range cuts profits in cattle production. West. Livestock Jour. 23 (22): 19, 77-79, illus.

Discusses the effects of intensity of grazing upon the animals and recommends moderate to close utilization of California annual-type ranges.

(50) HART, GEORGE H., WAGNON, KENNETH A., and GUILBERT, H. R.
1945. Factors in culling range breeding herds. Pacific Stockman. 11 (5): 4, 8, 16. (Also published in Calif. Cattleman. 1945, August. pp. 19-20; and in Calif. Cultivator. 1945. 92 (10): 271, under title "Culling range breeding herds.")

The importance of keeping accurate records of the performance of individual cows and calves is stressed as a means of making wise choices for culling.

(51) HART, G. H., GUILBERT, H. R., and WAGNON, K. A.
1945. Supplemental feeding—how much gain? Pacific Stockman. 11 (11): 9, 34. (Also in Calif. Cattleman. 1945, December. pp. 22-23; and West. Livestock Jour. 1945. 24 (6): 62, 64, under title, "Supplemental feeding.")

Experimental evidence shows the desirability of securing continuous growth by supplemental feeding during the deficient dry forage season.

(52) HART, G. H., GUILBERT, H. R., WAGNON, K. A., and GOSS, H.
1947. "Acorn calves," a nonhereditary congenital deformity due to maternal nutritional deficiency. Calif. Agr. Expt. Sta. Bul. 699. 24 pp., illus.

Acorn calf condition is nonhereditary and instead is caused by maternal nutritional deficiency.

(53) ROLLINS, W. C., and WAGNON, K. A.
1956. A genetic analysis of weaning weights in a range beef herd operated under optimum and sub-optimum nutritional regimes. Jour. Anim. Sci. 15 (1): 125-133.

Analysis was made of both a supplemented and unsupplemented herd. Difference in nutritive levels did not affect heritability of weaning weights.

(54) ROLLINS, W. C., and WAGNON, K. A.
1956. Heritability of weaning grade in range beef cattle. Jour. Anim. Sci. 15 (2): 529-536.

A statistical study showed no significant difference in heritability of weaning grade between supplemented and non-supplemented cow herds although heritability for both herds averaged an estimated 36 percent.

(55) WAGNON, K. A., and GUILBERT, H. R.
1940. An investigation of weighing procedure and percentage shrinkage under various forage conditions with experimental range cattle. Presented at Western Branch meeting of Amer. Soc. of Anim. Prod. at Montana State College, Bozeman, Mont. June 27-29, 1940. (Processed).

Recommends a uniform procedure of bringing cattle to corrals in the evening, allowing watering till 6:00 p.m. and then weighing them after 12 hours without feed and water.

(56) WAGNON, KENNETH A.
1941. Grazing habits of range cattle. Calif. Cultivator. 88 (25): 729. (Also in West. Livestock Jour. 1942. 20 (6): 35-36.)

Reports the species of range forage selected by cattle at various times of the year as determined by climatic conditions, relative abundance of different plant species, stage of growth, and availability.

(57) WAGNON, K. A.
1942. High percentage calf crops necessary. Calif. Cultivator. 89 (25): 629. (Also in West. Livestock Jour. 1943. 21 (17): 20 under title "More calves, more beef. Care of cows, bulls, and forage helps calf crop." Wagnon, Kenneth A.)

Relates important factors in obtaining a desirable calf crop in a time of high demand for meat.

(58) WAGNON, K. A.
1943. Finishing long-yearling heifers upon the range. Pacific Rural Press. 145 (8): 236.

Advisability of supplemental feeding to finish heifers on the range is discussed and rations are described.

(59) WAGNON, KENNETH A.
1943. Great steers from little acorns do not grow. Pacific Rural Press. 146 (13): 335.

Cattle fed acorns during the dry forage season suffered severe weight loss but made good gains when a protein supplement was added.

(60) WAGNON, K. A., GUILBERT, H. R., and HART, G. H.
1945. Death losses in experimental range herd. Calif. Cultivator. 92 (7): 184-185. (Also in Calif. Cattleman. 1945, September. p. 18, and Pacific Stockman. 1946. 12 (3): 13. under title "Cutting death losses adds to profits".)

Various sources of cattle loss over a nine-year period are discussed as to cause, importance, and treatment.

(61) WAGNON, K. A.
1945. Poison! Durango root found toxic to livestock. West. Livestock Jour. 23 (54): 108.

Discusses experiments with a native plant only recently discovered to be very toxic to livestock.

(62) WAGNON, K. A., and HART, G. H.
1945. Durango root (Datisca glomerata) poisoning of range stock. Jour. Amer. Vet. Med. Assoc. 107 (820): 3-5, illus.

Sheep and cattle were subjected to sublethal and lethal doses of durango root to observe the symptoms and causes of death.

(63) WAGNON, K. A.
1946. Acorns as range cattle feed. Calif. Cattleman. November. pp. 19, 26, 27. (Also in West. Livestock Jour. 1946. 25 (6): 92-94 under title "Acorns as feed for range cattle,")

Heavy consumption of acorns when other dry forage is deficient in protein may result in excessive weight loss unless the cattle are given a protein supplement.

(64) WAGNON, K. A., HART, G. H., and GUILBERT, H. R.
1947. When and how to supplement the deficient range. Calif. Cattleman. Mar. pp. 12-13. (Also in West. Livestock Jour. 1947. 25 (33): 45-46 under title "How, where, when to supplement deficient range.")

Results of a 10 year study show the advantages of supplemental feeding during the dry and inadequate green forage periods.

(65) WAGNON, K. A.
1948. Elastration of calves. Calif. Dairymen. 28 (18): 14. (Also in West. Livestock Jour. 1948. 26 (59): 127 under title, "Elastration—University reports experiment results" and in Calif. Farmer. 1948. 189 (9): 356.)

A relatively new method of castration using the Elastrator was tested successfully upon 23 bull calves.

(66) WAGNON, K. A., HART, G. H., and GUILBERT, H. R.
1949. Nutrition—supplementing the deficient range. Pacific Stockman. 15 (9): 3-5, 30.

Stresses need for flexible supplementing as regulated by severity, length, and season of the deficiency.

(67) WAGNON, KENNETH A.
1950. Supplemental feeding of cattle on the range. Calif. Cattleman. June. pp. 17-19, illus. (Talk presented at field day).

A discussion of results shown by supplemental feeding experiments consisting of seasonal diet changes, improved calf crop percentages, and weaning weights, and self-supplemental feeding.

(68) WAGNON, K. A.
1951. Nontoxic ferns—feeding tests with cattle find gold fern, birdsfoot fern nontoxic. Calif. Agr. 5 (10): 13, illus.

Quantities of fern fed, greatly in excess of any amount taken by grazing cattle, indicated they were nontoxic.

(69) WAGNON, K. A.
1952. Range bull study—University program results in top growth, development, and condition. West. Livestock Jour. 30 (10): 86-87, 89, illus.

Several supplemental feeding methods were used before an acceptable one was devised for maintaining good growth, development, and condition of range bulls.

(70) WAGNON, KENNETH, and GOSS, Harold
1953. Molasses-urea as a supplement to dry range forage for weaner heifers. Calif. Cattleman. Oct. pp. 20-22. (Also in "Roundup of Livestock Facts" Calif. Ext. Serv. 1953, May. pp. 3-7.)

Presents data from a study concerned with feeding cattle various range supplements including forage sprayed with a molasses-urea mixture.

(71) WAGNON, KENNETH A.
1954. Pounds of beef produced when produce is sold at different ages. Calif. Livestock News. 30 (25): 4. (Also in Calif. Cattleman. 1954, June. pp. 6-7, 10, illus. under title, "Age at which cattle sold has big bearing on efficiency of livestock operations.")

Reviews the results of 13 years of study in which range produce was marketed as weaners, yearlings, or 2-year-olds, and emphasizes that systems found impractical in the past may become practical in present or future operations.

(72) WAGNON, KENNETH A.
1954. The use of molasses-urea as a supplement to dry range forage for weaner calves. Calif. Cattleman. Jul. pp. 8-9, illus.

Reports a study showing that good gains may be obtained from dry forage by spraying molasses-urea on the swale vegetation.

(73) WAGNON, K. A., BENTLEY, J. R., and GREEN, L. R.
1958. Steer gains on annual-plant range pastures fertilized with sulfur. Jour. Range Mangt. 11 (4): 177-182.

Sulfur fertilization increased both carrying capacity and average steer gains during the green and dry seasons. No increases were evident during the inadequate green season.

Zoological

(74) AUGUSTSON, G. F., and WOOD, SHERWIN F.
1953. Notes on California mammal ectoparasites from the Sierra Nevada foothills of Madera County. Bul. So. Calif. Acad. Sci. 52 (2): 48-56.

A listing of 21 species of ectoparasites found upon 520 mammal hosts including man.

(75) CHILDS, HENRY E., JR.
1952. The kangaroo rat preyed upon by the sparrow hawk. Jour. Mammal. 33 (4): 493-494.

Records the observation of a diurnal bird preying upon a nocturnal mammal.

(76) CHILDS, HENRY E., JR.
1953. Selection by predation on albino and normal spadefoot toads. Evolution. 7 (3): 228-233, illus.

Statistically significant reduction was observed in the albino form of tadpoles due to natural predation by racoons.

(77) CHILDS, HENRY E., JR., and HOWARD, WALTER E.
1955. The vertebrate fauna of the San Joaquin Experimental Range. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Misc. Paper No. 19. 20 pp. (Processed).

A listing of the vertebrate fauna and brief notes on abundance.

(78) COHEN, NATHAN W.
1951. California condors in Madera County, California. The Condor. 53 (3): 158.

Reports the observation of 9 of the rare birds passing over the San Joaquin Experimental Range.

(79) COHEN, NATHAN W., and WOOD, SHERWIN F.
1953. Vertebrate census of an earth, stone, concrete check dam at the San Joaquin Experimental Range. Bul. So. Calif. Acad. Sci. 52 (1): 35-37, illus.

The removal of a granite boulder, earth fill dam afforded the opportunity to list the 16 species of vertebrate fauna found in the structure.

(80) EMLEN, JOHN T., JR., and GLADING, BEN
1938. California ground squirrel robs nest of valley quail. The condor. 40 (1): 41-42.

Tells how a ground squirrel repeatedly returned to a quail nest and took eggs despite attacks by the parent quail.

(81) FITCH, HENRY S.
1940. Some observations on horned owl nests. The Condor. 42 (1): 73-75.

Observations made of 5 nests revealed loss of young due to weather, predators, and unsanitary conditions caused by uneaten prey.

(82) FITCH, HENRY S., and TWINING, HOWARD
1946. Feeding habits of the Pacific rattlesnakes. Copeia. (2): 64-71.

Stomach and scat examinations were used to determine diet. Ground squirrels were the most common food.

(83) FITCH, HENRY S., GLADING, BEN., and HOUSE, VERL.
1946. Observations on Cooper hawk nesting and predation. Calif. Fish & Game. 32 (3): 144-154, illus.

A Cooper hawk nest was closely watched from incubation until the young were raised.

(84) FITCH, HENRY S., SWENSON, FREEMAN, and TILLOTSON, DANIEL F.
1946. Behavior and food habits of the red-tailed hawk. The Condor. 48 (5): 205-237, illus.

Detailed description of many of the activities of this resident of the Digger pine belt.

(85) FITCH, HENRY S., and GLADING, BEN
1947. A field study of a rattlesnake population. Calif. Fish & Game. 33 (2): 103-123, illus.

A detailed study of growth, movement, seasonal habits, and feeding of rattlesnakes.

(86) FITCH, HENRY S., and WAGNON, KENNETH A.
1947. Rattlesnakes on the range. Pacific Stockman. 13 (6): 8-9, illus. (Also in West. Dairy Jour. 1947. 3 (51): 23, 78-79 under title "Rattlesnakes! on western farm lands.")

The rattlesnake is discussed as a cause for weight and death loss in cattle herds.

(87) FITCH, HENRY S.
1947. Ecology of a cottontail rabbit (Sylvilagus auduboni) population in central California. Calif. Fish & Game. 33 (3): 159-184.

A detailed study showing that the rabbit is an important prey of many mammals, birds, and snakes.

(88) FITCH, HENRY S.
1947. Predation by owls in the Sierran foothills of California. The Condor. 49 (4): 137-151, illus.

Presents a breakdown of mammals, birds, reptiles, amphibians, invertebrates, and carrion consumed by the horned owl, barn owl, and red-tailed hawk.

(89) FITCH, HENRY S.
1947. Ground squirrels mean destroyed forage. West. Livestock Jour. 25 (60): 37, 109-110, 112.

Detailed study of ground squirrels showed that they may account for a loss of 1,000 pounds per acre of the herbage crop when at the abnormally high population of 12 per acre.

(90) FITCH, HENRY S.
1948. Habits and economic relationships of the Tulare kangaroo rat. Jour. Mammal. 29 (1): 5-35, illus.

This animal is of minor economic importance, compared with the ground squirrel and pocket gopher.

(91) FITCH, HENRY S.
1948. A study of coyote relationships on cattle range. Jour. Wildlife Mangt. 12 (1): 73-78.

Coyotes had little effect on ground squirrel, cottontail, kangaroo rat, or gopher population. Tells of individual coyote attacks on calves.

(92) FITCH, HENRY S.
1948. Ecology of the California ground squirrel on grazing lands. The Amer. Midland Nat. 39 (3): 513-596, illus.

An intensive study involving census counts, feeding records, and general observations shows ground squirrel competition with livestock to be most severe during late fall, winter, and spring.

(93) FITCH, HENRY S.
1949. Study of snake populations in central California. The Amer. Midland Nat. 41 (3): 513-579, illus.

Discusses 9 species of snakes which occur on the Experimental Range; deals mostly with the abundant rattlesnake and gopher snake.

(94) FITCH, HENRY S., and BENTLY, J. R.
1949. Use of California annual-plant forage by range rodents. Ecol. 30 (3): 306-321, illus.

Intensive investigations revealed that use of forage by ground squirrels, gophers, and kangaroo rats in a typical range population would account for one-third of the annual herbage crop.

(95) GLADING, BEN
1938. A male California quail hatches a brood. The Condor. 40 (6): 261.

A male California quail was observed hatching and caring for a brood after the death of the female.

(96) GLADING, BEN
1938. Studies on the nesting cycle of the California valley quail in 1937. Calif. Fish & Game. 24 (4): 318-340, illus.

Describes courting and nesting behavior, nesting cover, number of nests, size of the clutch, and predator relationships of the California valley quail.

(97) GLADING, BEN, BISWELL, HAROLD H., and SMITH, CLARENCE F.
1940. Studies on the food of the California quail in 1937. Jour. Wildlife Mangt. 4 (2): 128-144, illus.

Reports the plant species and parts that make up the diet of quail at various seasons of the year and develops a formula for desirability of quail food.

(98) GLADING, BEN
1941. Valley quail census methods and populations at the San Joaquin Experimental Range. Calif. Fish & Game. 27 (2): 33-38, illus.

Describes the "horseback" method of valley quail census which gives an estimated 90 percent accuracy when used in relatively open country after birds are in definite coveys and the weather is suitable.

(99) GLADING, BEN., and SAARNI, ROY W.
1944. Effect of hunting on a valley quail population. Calif. Fish and Game. 30 (2): 71-79.

Hunting a known quail population by a known number of hunters showed that the quail population withstood an annual bag kill of 25 percent.

(100) HERMAN, CARLTON M., and GLADING, BEN
1942. The protozoan blood parasite Haemoproteus lophortyx O'Roke in quail at the San Joaquin Experimental Range, California. Calif. Fish & Game. 28 (3): 150-153, illus.

Reports the presence of the infection in 84 percent of the 503 quail examined.

(101) HERMAN, CARLTON M., JANKIEWICZ, HARRY A., and SAARNI, ROY W.
1942. Coccidiosis in California quail. The Condor. 44 (4): 168-171.

Fecal droppings examined have demonstrated the presence of coccidian infection in quail.

(102) HERMAN, CARLTON M., and CHATTIN, JOHN E.
1943. Epidemiological studies on coccidiosis of California quail. Calif. Fish & Game. 29 (4): 168-179, illus.

An extensive study indicated that the incidence of infection was often large, ranging upward to more than 90 percent of the birds.

(103) HERMAN, CARLTON M., and JANKIEWICZ, HARRY A.
1943. Parasites of cottontail rabbits on the San Joaquin Experimental Range, California. Jour. Wildlife Mangt. 7 (4): 395-400.

Many types of internal parasites found in rabbits are described.

(104) HORN, EVERETT E., and FITCH, HENRY S.
1946. Trapping the California ground squirrel. Jour. Mammal. 27 (3): 220-224, illus.

Describes a wire box trap with a sensitive pendulous trigger successfully used to catch the wary ground squirrel.

(105) HOWARD, WALTER E.
1949. Gopher snake killed trying to swallow cottontail. Copiea. (4): 289, illus.

Notes a factor which may occasionally account for some death loss of snakes.

(106) HOWARD, WALTER E.
1950. Birds as bullfrog food. Copiea. (2): 152, illus.

Briefly reports observing a frog catch and ingest a brown towhee.

(107) HOWARD, WALTER E.
1950. Wildlife depredations on broadcast seedings of burned brushlands. Jour. Range Mangt. 3 (4): 291-298, illus.

Failure of broadcast seedings because of depredations by rodents, birds, and harvester ants may be prevented by certain treatment of the seed coats.

(108) HOWARD, WALTER E., and WAGNON, KENNETH A.
1951. Guard those spuds. West. Livestock Jour. 29 (7): 81, 83, illus.

Ground squirrels showed preference for cull potatoes spread in a pasture to dry for cattle feed. Control was suggested where potatoes are being fed.

(109) HOWARD, WALTER E.
1951. Poison-dye combinations can save brush burn seedings from wildfire. Calif. Cattleman. Feb. pp. 14-16.

Coating seeds with yellow dye and Compound 1080 prevented losses due to birds, rodents, and harvester ants.

(110) HOWARD, WALTER E.
1951. Wildlife control—depredations on seedings require protective action. West. Livestock Jour. 29 (27): 92-94.

Tells of treatment procedures and precautions for Compound 1080 and strychnine to be used in treatment of range seeds.

(111) HOWARD, WALTER E., and INGLES, LLOYD G.
1951. Outline for an ecological life history of pocket gophers and other fossorial mammals. Ecol. 32 (3): 537-544.

Drawing on a background of pocket gopher research at the San Joaquin Experimental Range, the author lists a number of general problems and study methods for the purpose of aiding future research.

(112) HOWARD, WALTER E.
1951. Relation between low temperature and available food to survival of small rodents. Jour. Mammal. 32 (3): 300-312.

Explains the effects of insufficient food intake and cold weather in causing "cold weather" starvation.

(113) HOWARD, WALTER E.
1952. A live trap for pocket gophers. Jour. Mammal. 53 (1): 61-65, illus.

Describes an improved gopher trap which can be placed in the soil before being set and can be checked as to whether or not the trap is sprung without digging it up.

(114) HOWARD, WALTER E.
1952. Concerning our predators. Calif. Farmer. 196 (4): 184-185.

A discussion of predator-prey relationships, with considerable application of studies conducted at the San Joaquin Experimental Range.

(115) HOWARD, WALTER E.
1952. The pesky pocket gopher. Spreckels Sugar Beet Bul. 16 (3): 21-22, illus.

Describes the activities and effects of California's most important burrowing rodent.

(116) HOWARD, WALTER E.
1953. Tests of pocket gophers gnawing electric cables. Jour. Wildlife Mangt. 17 (3): 296-300, illus.

Results of a laboratory test at the Experimental Range indicates pocket gophers are able to gnaw through non-metallic armored cables and soft metallic armor but not certain harder metals and small wires.

(117) HOWARD, WALTER E.
1953. A trigger mechanism for small mammal live traps. Jour. Mammal. 34 (4): 513-514.

Describes a triggering device which is simple to construct, easy to repair, and free from the floor of the trap.

(118) HOWARD, WALTER E.
1953. Rodent control on California ranges. Jour. Range Mangt. 6 (6): 423-434.

Discusses the interrelations between rodents, predators, and man upon rangeland.

(119) HOWARD, WALTER E.
1957. Melanism in Peromyscus boylei. Jour. Mammal. 38 (3): 417.

Reports the finding of a completely black, female, white-footed mouse.

(120) HOWARD, W. E.
1957. Amount of food eaten by small carnivores. Jour. Mammal. 38 (4): 516-517.

The daily intake of rodents and birds was determined with three caged carnivores: the ring-tailed cat, house cat, and long-tailed weasel.

(121) MILLER, MILTON A., and HOWARD, WALTER E.
1951. Size of bait for pocket gopher control. Jour. Wildlife Mangt. 15 (1): 62-68.

A study showing that any size of bait within practical limits may be effectively used for pocket gopher poisoning provided sufficient dosages of poison are used.

(122) MOREJOHN, G. VICTOR, and HOWARD, WALTER E.
1956. Molt in the pocket gopher, Thomomys bottae. Jour. Mammal. 37 (2): 201-213, illus.

Study of 600 pocket gophers by various techniques revealed certain molt patterns and variations in these patterns.

(123) QUAST, JAY C.
1950. Habitat preferences of rodents on grazed and ungrazed foothill pastures in California. Univ. of Calif. M. A. Thesis. 51 pp., illus.

Intensive studies involving small rodent populations in areas of heavy, moderate, and no utilization by cattle showed populations of some species to be the same or less on grazed areas, whereas other species tended to be more plentiful in areas that were grazed.

(124) QUAST, JAY C., and HOWARD, WALTER E.
1953. Comparison of catch of two sizes of small mammal live traps. Jour. Mammal. 34 (4): 514-515.

A much larger percentage of white-footed mice, and to a lesser extent of kangaroo rats were caught in the larger traps.

(125) QUAST, JAY C.
1954. Rodent habitat preferences on foothill pastures in California. Jour. Mammal. 35 (4): 515-521.

Reports effects of utilization of forage by cattle upon small rodent habitats and populations.

(126) WILKINSON, ARLENE
1953. Birds of the foothill woodland community. Fresno State College. M. S. Thesis. 33 pp., illus.

Observations made of 46 species of birds seen during the winter and spring.

(127) WOOD, SHERWIN F.
1950. The distribution of California insect vectors harboring Trypanosoma cruzi Chagas. Bul. So. Calif. Acad. Sci. 49 (3): 98-100.

Reports location of collections made of cone-nosed bugs with the causitive agent of Chagas' disease often present.

(128) WOOD, SHERWIN F.
1951. Importance of feeding and defecation times of insect vectors in transmission of Chagas' disease. Jour. Econ. Ent. 44 (1): 52-54.

Certain species of cone-nosed bugs are shown to be more important as a source of contamination because they tend to defecate immediately after feeding.

(129) WOOD, SHERWIN F.
1951. Development of California Trypanosoma cruzi in the bat bedbug. Jour. Parasitol. 37 (3): 330-331.

A laboratory technique was used to develop and observe the causitive agent of Chagas' disease in the bat bedbug.

(130) WOOD, SHERWIN F.
1951. Bug annoyance in the Sierra Nevada foothills of California. Bul. So. Calif. Acad. Sci. 50 (2): 106-112.

A report of the various house-invading arthropods discovered in a dwelling house during a period of 58 days.

(131) WOOD, SHERWIN F.
1952. Mammal blood parasite records from southwestern United States and Mexico. Jour. Parasitol. 38 (1): 85-86.

Parasites from blood samples of 215 mammals collected at the Experimental Range make an important contribution to the records collected in southwest United States and Mexico.

(132) WOOD, SHERWIN F.
1952. Trypanosoma cruzi revealed in California mice by zenodiagnosis. The Pan-Pacific Ent. 28 (3): 147-153.

Reports results of allowing 186 mammals to be fed upon by cone-nosed bugs to determine the incidence of infection with Trypanosoma cruzi.

(133) WOOD, SHERWIN F. and WOOD, FAE D.
1952. A water cooler for transporting heat sensitive animals, especially insects. Bul. So. Calif. Acad. Sci. 51 (3): 108-111.

A method is described for keeping heat susceptible animals cool and alive while traveling across hot regions of California.

(134) WOOD, SHERWIN F.
1953. Survival time of metacyclic Trypanosoma cruzi in human sweat. Jour. Parasitol. 39 (5): 569-570.

A study devised to determine how well Trypanosoma cruzi survives in human sweat.

(135) WOOD, SHERWIN F.
1954. Environmental temperature as a factor in development of Trypanosoma cruzi in Triatoma protracta. Expt. Parasitol. 3 (3): 227-233.

A study designed to determine the effect of temperature upon the number of Trypanosoma cruzi released from cone-nosed bugs.

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